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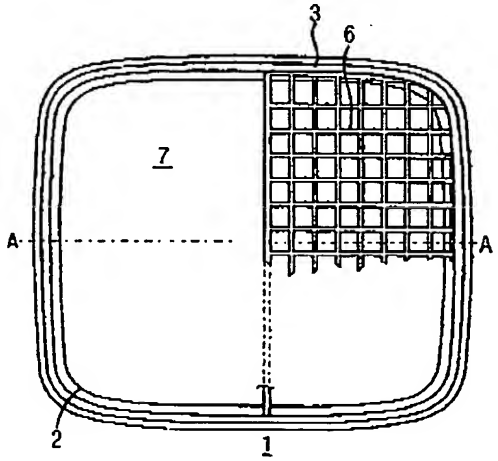
(54) A container for roller-applied coating compositions and its use in coating procedures for rough surfaces

(57) A container (1) for a roller-applied viscous coating composition (5) which facilitates non-messy loading of the composition onto a roller and non-messy removal of excess composition from the roller. The container has an opening large enough to allow insertion of the roller and also a grid (6) located below the opening but extending only part way across the container so as to leave access (7) to a lower portion (1a) of the container below the grid where when in use, coating composition is stored. Insertion of the roller into the composition and its subsequent withdrawal load excess composition onto the roller. The excess composition can be removed from the roller by rolling it across the grid from where the excess drips back into the main volume of the composition. Loading the roller, removal of the excess and its return to the lower portion all occur within the container so avoiding mess.

Also the lidded container when containing coating composition and its use in a procedure for coating rough surfaces using high viscosity coating compositions.

Fig. 1



EP 1 293 360 A1

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Description

[0001] This invention relates to a container for roller-applied coating compositions and its use in coating procedures for rough surfaces.

[0002] Amateur or "DIY" (do-it-yourself) painters are reluctant to apply coating compositions (such as paints) by roller because of the perceived messiness of the procedure. The messiness arises because when a roller is dipped into a coating composition, it is usually loaded with an excess of the composition, especially if the painter is an amateur. The excess has to be removed from the roller or else it will drip and worse still, the excess will splash and fly from the roller when it is being rotated during the coating procedure. Current techniques for removing the excess do create a risk of mess.

[0003] The reluctance of amateurs to use rollers is further increased when the surface to be coated is rough as is the case when garden fences or decking made from sawn wood are to be coated and particularly if the fencing or decking comprise overlapping panels. This greater reluctance comes from the need to use a high degree of patience and skill to cause a coating composition to flow into recesses present in rough surface or overlapping surfaces and these recesses must be coated if uniform coating of the surface is to be achieved. It has now been discovered that the difficulties associated with achieving a uniform coating of a rough surface can be greatly reduced by using coating compositions which have viscosities much higher than those of conventional coating compositions used as wood preservatives. However, the use of higher viscosities increases the problems of messiness.

[0004] Current techniques for removing excess coating composition from a roller are basically of two types. The first type is widely used in the United Kingdom and it employs a tray provided with a well and a flat surface which slopes down to the well. Coating composition is poured from a container into the well and then a roller is loaded by inserting it into the coating composition in the well where it picks up an excessive amount of the composition. The excess is removed by withdrawing the roller from the well and rolling it over the flat surface whereupon excess composition is transferred onto the surface from where it drains back down the slope into the well. The use of such trays presents several risks of mess. Firstly, coating composition has to be poured from a container into the well which can be a messy operation when performed by amateurs, especially if the container is large and heavy. Secondly, the tray is awkward to hold or carry which creates a risk of tilting and consequent spillage of the composition from the well or flat surface. Thirdly, the tray has to be cleaned after use which can also be a messy operation when performed by amateurs.

[0005] The second technique for removing excess coating composition from a roller is widely used in Germany and it employs a grid (or "Gitter" to use the German word). The grid is held over an open container which is dimensioned so as to allow a roller to be inserted into the container and which contains a volume of coating composition. The roller is inserted into the coating composition where it picks up an excessive amount of the composition. The roller is withdrawn from the coating composition and excess composition is removed by rolling the roller across the grid so as to transfer coating composition from the roller onto the grid from which it drips back into the main volume of the coating composition. The technique requires the grid to be held steadily over the container both whilst the roller is being rolled across it and whilst excess composition is dripping back into the main volume of composition. Such steady control of the grid can be difficult for amateurs particularly if a large roller is being used. In addition, after use, the grid either has to be discarded or cleaned and both options can result in coating composition contaminating other places.

[0006] A further technique involves a controlled loading of a roller by means of a grid floating on a semi-solid coating composition contained in a tray. The roller is loaded by rolling it back and forth across the floating grid so that coating composition flows through the grid and onto the roller which loads in a more controlled way with less risk of excessive loading. The technique requires the composition to be supplied in a tray dimensioned so as to be able to receive the back and forth movement of the roller but it works well provided that excessive pressure of the roller on the grid is avoided. However, avoidance of excessive pressure does require skill especially if the tray is being used in a restricted space such as at the top of a ladder. The coating composition must also be semi-solid which is not ideal for use on rough surfaces.

[0007] One of the objects of this invention is to provide a container for roller-applied coating compositions which container assists relatively mess-free removal of excess composition from a roller and which is especially suited for use with compositions of a viscosity high enough to facilitate uniform coating of rough or overlapping surfaces.

[0008] Accordingly, this invention provides a container for a roller-applied coating composition which container has an opening dimensioned so as to allow a roller to be insertable into the container and into coating composition if contained in the container wherein the container is also provided with a grid for removing excess coating composition from a roller which grid is located below the opening and extends only part way across the container. In order to facilitate the coating of rough or overlapping surfaces, any coating composition contained in the container should preferably have a Rotothinner mid-shear viscosity at 20°C of at least 5 Pa.sec (Pascal.second) and an ICI Cone & Plate high shear viscosity of at least 0.03 Pa.sec. Usually the mid-shear viscosity will not exceed 130 Pa.sec and the high shear viscosity will not exceed 0.1 Pa.sec.

[0009] The dimensions of the opening into the container are chosen so as to allow a conventional paint roller to be insertable down into the container. Usually this means choosing a container which is essentially rectangular with a width at least slightly greater than the width of conventional paint rollers. The provision of a grid which extends only part way across the container makes it possible to leave an access for the roller past the grid into the lower portion of the container and particularly into any coating composition supplied in this lower portion. On insertion of a roller through this access into the coating composition, the roller picks up an excess of the composition. The roller may then be withdrawn to just above the grid and subsequently rolled across the grid to transfer excess composition from the roller onto the grid from where it drips back into the main volume of the coating composition. Provided that the grid is located sufficiently below the opening, the whole process of removal of excess coating composition from the roller to the grid and its return to the main volume of the composition can be performed within the protection of the container making mess almost impossible to create.

[0010] The optimum spacing of the grid from the opening will depend to a large extent on the diameters of the rollers intended for use with the container. As a general guide, the distance from the top surface of the grid to the opening should be at least 75% of the diameter of the largest roller anticipated to be used. A distance of 100% of this diameter will ensure full protection against mess from the container and in practice a minimum distance of about 400mm is usually chosen. The distance from the grid to the base of the container is chosen to be commensurate with the volume of coating composition required to be supplied.

[0011] The grid may be supported in the container by any convenient method such as adhesive bonding to the walls of the container. However, it is preferably provided as part of a collar which is inserted as a close fit into the container and snap-fitted around the rim which defines the opening into the container. The collar may also carry snap-fit means for receiving a lid which closes the opening into the container. Such an arrangement has the advantage that the lid and collar can be co-assembled and then the co-assembly can be snap-fitted onto the container in a single operation after the container has been filled with coating composition. Preferably the lid is more flexible than the collar so as to facilitate removal of the lid from the collar without causing an unintentional displacement of the collar from the container. Further resistance to such unintentional displacement may be achieved by providing a frangible bond or an easily disengageable connection between the collar and the container which requires a positive act to break or disengage. An adhesive bond may be used.

[0012] The container, grid or collar and lid may be made by injection moulding thermoplastics such as polyolefins including polypropylene, high, low and medium density polyethylenes and copolymers of propylene and ethylene. Other possible thermoplastics include polyamides, polyesters and butadiene-styrene copolymers.

[0013] The invention is illustrated by the following preferred embodiment described with reference to the drawings of which

Figure 1 is a plan view of a container according to this invention,

Figure 2 is a vertical section along the line A-A through the container shown in Figure 1 but with a lid in place and a volume of coating composition supplied in a lower portion of the container,

Figure 3 is a detail from Figure 2 which shows on a larger scale the snap-fitting means for the collar and lid.

[0014] Figure 1 shows a plan view of an empty container 1 having a base 2 and into which a close fitting collar 3 has been inserted. Base 2 and Collar 3 are more clearly shown in Figure 2. Figure 2 also shows top rim 9 of container 1 which defines an opening into container 1 which is rectangular and dimensioned so as to allow insertion of a conventional paint roller into container 1. Collar 3 carries a horizontal grid 6 which extends half way across container 1 so as to leave an access 7 which is amply large enough to allow passage of a conventional paint roller.

[0015] In use, the lower portion 1a of container 1 is filled with coating composition 5 to a level below grid 6 and is then closed by lid 4. To load a roller with coating composition 5, lid 4 is removed thereby opening container 1 and the roller is inserted via access 7 into coating composition 5. Withdrawal of the roller produces a roller which is loaded with an excess of coating composition 5. The roller is withdrawn through access 7 and then rolled across the upper surface of grid 6 whereupon excess coating composition 5 is transferred from the roller onto grid 6. The roller now loaded with an appropriate amount of coating composition 5 can be completely withdrawn from container 1 whilst the removed excess coating composition 5 drips down from grid 6 back into the main volume of coating composition 5 in the lower portion 1a of container 1. The entire procedure for loading a roller with an appropriate amount of very viscous coating composition 5 and for the return of excess composition to the lower portion 1a of container 1 is performed within the protective confines of open container 1 and so the risk of mess is virtually nil.

[0016] Figure 3 shows on a larger scale the top right corner of container 1 when lidded. In particular, it shows how lid 4 makes a snap-fit onto a resilient top rim 8 of collar 3 and how in turn collar 3 snap fits onto top rim 9 of container 1.

[0017] Lid 4 is provided with a dependant resilient skirt 11 which in turn is provided with an inwardly projecting

rib 12 engaged by a co-operating outwardly projecting rib 13 provided on resilient rim 8 of collar 3. Press-fitting rib 12 on lid 4 over rib 13 on collar 3 causes lid 4 to become engaged on collar 3 with a snap fit.

[0018] Similarly, collar 3 is provided with a dependent resilient skirt 14 which in turn is provided with an inwardly projecting rib 15 engaged by a co-operating outwardly projecting rib 16 provided on resilient rim 9 of container 1. Press fitting rib 15 on collar 3 over rib 16 on rim 9 cause collar 4 to become engaged on container with a snap fit. Rib 9 is also provided with a dependent reinforcing skirt 17 which resists distortion of rim 9 so helping to maintain a good snap fit during transportation of the container. Skirt 17 is also provided with a sloping shoulder 18 to which skirt 14 of collar 3 can be lightly adhesively bonded to guard against unintentional removal of collar 3 from container 1.

[0019] Whilst containers according to this invention can be used in procedures for coating both rough and smooth surfaces, they are especially well suited for use in procedures for coating rough and uneven surfaces such as those found on sawn wood fence panels and particularly where panels overlap. Hitherto the awkward recesses in such surfaces could only be efficiently coated by amateurs if the amateurs used brushes and applied relatively fluid coating compositions. Such fluid coating compositions would have Rotothinner mid-shear viscosities as low as about 0.08Pa.s at 20°C and ICI Cone & Plate high shear viscosities as low as 0.025Pa.s at 25°C. Compositions of this high degree of fluidity are not suitable for efficient application by roller.

[0020] As mentioned earlier, it has been discovered that coating compositions can be efficiently applied to rough surfaces by roller if the composition has a quite high viscosity and the problem of mess associated with loading highly viscous coating compositions onto rollers can be overcome. Suitable highly viscous coating compositions need to have Rotothinner mid-shear viscosities of from 5 to 130 (preferably from 60 to 130) Pa.sec at 20°C and ICI Cone and Plate high shear viscosities of from 0.03 to 0.1 (preferably from 0.07 to 0.1) Pa.sec at 25°C. It has been found that appropriate amounts of such viscous coating compositions can be loaded onto rollers in a non-messy way even by amateurs if the loading and recovery of excess composition is performed within the protection of a container according to this invention. In addition, the loading does not require the use of a device such as a tray which needs to be washed after use and the containers can be easily fitted with a handle of the type conventionally used on paint cans so as to make it easy to hold the container steadily.

[0021] In view of the advantages of the use of containers according to this invention in procedures for coating rough surfaces, this invention also provides a method for applying a coating composition to a rough surface using a roller wherein

a) a coating composition is selected which composition has a Rotothinner mid-shear viscosity of from 5 to 130 Pa.s at 20°C and an ICI Cone & Plate high shear viscosity of from 0.03 to 0.1 Pa.s at 25°C,
b) the composition is supplied in a container provided with a grid according to this invention,
c) the roller is inserted into the coating composition and withdrawn bearing an excess loading of composition,
d) the withdrawn roller is rolled across the grid whereupon excess composition is removed and
e) after removal of the excess composition, the roller is rolled across the rough surface whereupon composition is transferred from the roller to the surface.

[0022] The method is particularly useful in applying a coating composition which contains a biocide of the type used in the preservation of wood.

[0023] This invention also provides a lidded container provided with a grid wherein the container contains a highly viscous coating composition as described above.

[0024] For the purposes of this invention, ICI Cone & Plate high shear viscosity is determined at 25°C as follows:

[0025] Fixed shear-rate viscosity is measured using the cone and plate technique described in ASTM Test D4287-87, but with conditions adapted to produce a shear rate of 10,000/sec. The cone has an angle of 0.5° and a radius of 7.5mm.

[0026] Rotothinner mid-shear viscosity is determined at 20°C using the Sheen/ICI Rotothinner (Electrical Model) described in the Sheen leaflet headed "Viscosity Sheen" published by Sheen Instruments Limited of Kingston on Thames, Surrey, England.

Claims

1. A container (1) for a roller-applied coating composition (5) which container has an opening dimensioned so as to allow a roller to be insertable into the container and into coating composition if contained in the container wherein the container also is provided with a grid (6) for removing excess coating composition from a roller which grid is located below the opening and extends only part way across the container leaving an access for the roller past the grid into the lower portion of the container.

2. A container according to Claim 1 in which the distance from the top surface of the grid to the opening is at least 75% of the diameter of the roller.

3. A container according to Claim 2 in which the distance is at least 100% of the diameter of the roller.

4. A container according to any of the preceding Claims, in which the grid is attached to the contain-

er.

5. A container according to Claim 4 in which the attachment is in a manner that requires a positive act to break the attachment.

6. A container as claimed in any of the preceding Claims, wherein the grid is carried by a collar (3) which makes a close fit within and is supported by the container.

7. A container as claimed Claim 6, wherein the collar is attached to the container to guard against unintentional removal of the collar from the container.

8. A container as claimed in any of the preceding Claims, wherein the container is provided with means to retain a lid (4).

9. A container as claimed in any one of Claims 6 to 8, wherein the container includes means for engaging a lid and/or the collar by means of a snap-fit.

10. A container according to any of the preceding Claims, wherein the container is closed by a lid and contains a coating composition having a Rotothinner mid-shear viscosity of from 5 to 130 Pa.s at 20°C and an ICI Cone & Plate high shear viscosity of from 0.03 to 0.1 Pa.s at 25°C.

11. A container according to Claim 10 wherein the Rotothinner mid-shear viscosity of the coating composition is at least 60 Pa.s at 20°C and its ICI Cone & Plate high shear viscosity is at least 0.7 Pa.s at 25°C.

12. A container as claimed in Claim 10 or Claim 11 wherein the coating composition contains a biocide of the type used in the preservation of wood.

13. A method for applying a coating composition (5) to a rough surface using a roller wherein

a) a coating composition is selected which composition has a Rotothinner mid-shear viscosity of from 5 to 130 Pa.s at 20°C and an ICI Cone & Plate high shear viscosity of from 0.03 to 0.1 Pa.s at 25°C;
b) the composition is supplied in a container provided with a grid (c) according to any one of Claims 1 to 9;
c) the roller is inserted into the coating composition and withdrawn bearing an excess loading of composition;
d) the withdrawn roller is rolled across the grid whereupon excess composition is removed and
e) after removal of the excess composition, the roller is rolled across the rough surface whereupon composition is transferred from the roller to the surface.

14. A method according to Claim 13 wherein the coating composition has a Rotothinner mid-shear viscosity of at least 60 Pa.s at 20°C and an ICI Cone & Plate viscosity of at least 0.7 Pa.sec at 25°C.

15. A method according to Claim 13 or Claim 14 wherein the coating composition contains a biocide of the type used in the preservation of wood.

Fig. 3

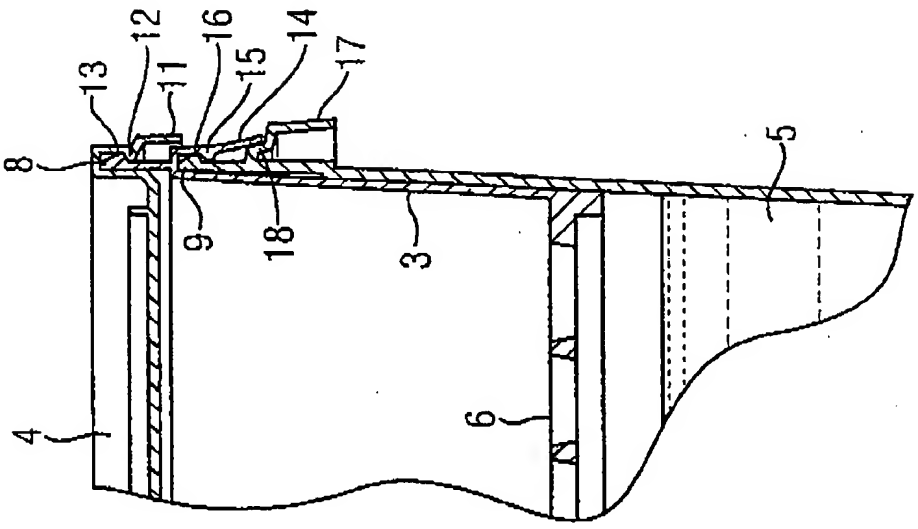


Fig. 1

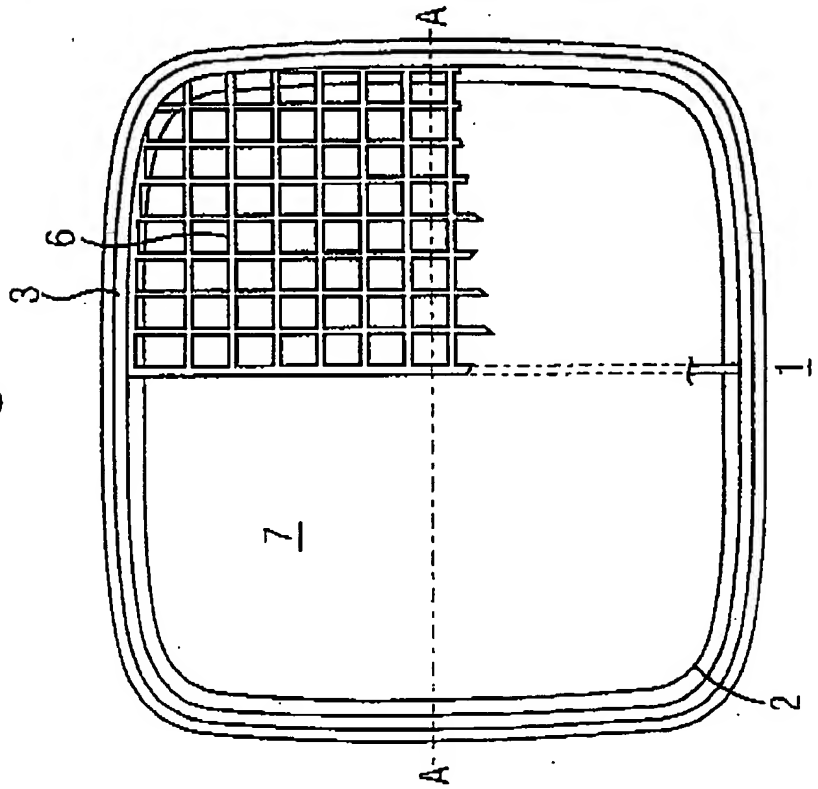
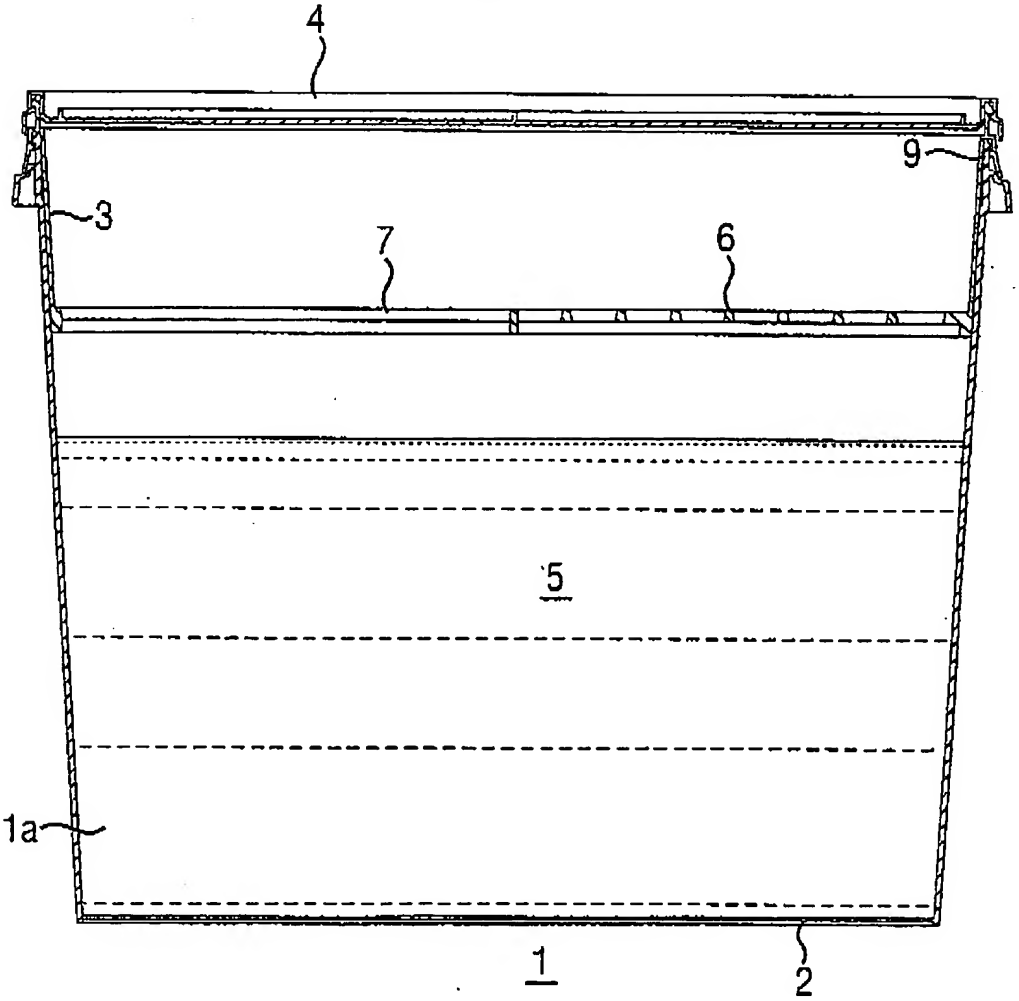


Fig. 2



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Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 September 2002	Pineau, A

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